Chapter 1
Introduction

1-1. Purpose

The purpose of this manual is to provide technical criteria and guidance for the planning, design, and construction of tunnels and shafts in rock for civil works projects. Specific areas covered include geological and geotechnical explorations required, construction of tunnels and shafts, design considerations, geomechanical analysis, design of linings, and instrumentation and monitoring.

1-2. Scope

a. This manual presents analysis, design, and construction guidance for tunnels and shafts in rock. A team comprised of highly skilled engineers from many disciplines is required to achieve an economical tunnel or shaft design that can be safely constructed while meeting environmental requirements. The manual emphasizes design, construction and an understanding of the methods, and conditions of construction essential to the preparation of good designs.

b. Since construction contracting is a major consideration in underground construction, the manual discusses some of the basic issues relating to contract document preparation; however, contract preparation is not covered.

c. The procedures in this manual cover only tunnels and shafts in rock. The general design philosophy and construction methods for rock tunnels and shafts is vastly different than for tunnels or shafts in soft ground. Therefore, tunnels and shafts in soft ground is not covered by this manual.

d. There are many important nontechnical issues relating to underground construction such as economics, as well as issues of operation, maintenance, and repair associated with the conception and planning of underground projects. These issues are not covered by this manual.

1-3. Applicability

This manual applies to all Headquarters, U.S. Army Corps of Engineers (HQUSACE) elements, major subordinate commands, districts, laboratories, and field-operating activities having responsibilities for the design of civil works projects.

1-4. References

Required and related publications are listed in Appendix A.

1-5. Distribution Statement

Approved for public release, distribution is unlimited.

1-6. Terminology

Appendix B contains definitions of terms that relate to the design and construction of tunnels and shafts in rock.